NPIC/TSSG/RED/SDB-021-70
1 May 1970

MEMORANDUM FOR: High Precision Stereocomparator Coordinating Committee

SUBJECT : Status of High Precision Stereocomparator (HPSC) Program

1. The technical monitor visited [ ] from 27-29 April to review the progress of the HPSC Program. 25X1

2. [ ] Project Manager is in [ ] performing acceptance tests on the optical system, so most of the information in this report was provided by Messrs. [ ] The program schedule was reviewed and an attempt was made at producing a realistic schedule for the remainder of the program. 25X1 25X1 25X1

a. [ ] expects to complete the optical acceptance tests on 4 May 1970. [ ] will crate the optics and they will leave [ ] on 19 May by TWA air freight. 25X1 25X1 25X1

b. The environmental control black box will arrive at [ ] on 8 May. [ ] expects to have it checked out and integrated into the system by 15 May 1970. [ ] will visit [ ] during this period. 25X1 25X1 25X1

c. [ ] has corrected the problems with the focusing pots in the Image Analysis System and report they are ready for [ ] to run acceptance tests. [ ] will start these tests at the [ ] plant on 4 May and complete them in about two weeks. [ ] plans on having the Image Analysis System arrive at the [ ] plant by 26 May. 25X1 25X1 25X1 25X1 25X1

d. [ ] plans on 4 weeks to assemble the optics and put the total HPSC system together. This will take until 17 June. 25X1

e. They plan on 10 weeks for the system checkout, interfacing, etc. This also includes 6 weeks of Informatics checking out the computer and programs. This will take until 26 August.

f. Preacceptance tests at the [ ] plant will take place from 26 August to 9 September. 25X1

g. [ ] will disassemble, crate, and ship the system to [ ] It will arrive at [ ] on 30 September. 25X1 25X1 25X1

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h. The installation and checkout at [redacted] will be completed by 25 November. 25X1

i. The acceptance tests run by [redacted] personnel will run from 25 November until 8 December. 25X1

j. PHD and ESD run further tests after 8 December.

k. Customer will make progress payments to [redacted] on 8 January 1971, 8 February 1971, and complete the contract on 8 March 1971. 25X1

25X1 3. On-the-job training of [redacted] personnel was discussed and the following dates appear to be the most feasible.

a. ESD optics technician help with optical checkout at [redacted] for 2 weeks starting 15 July 1970. 25X1

b. PHD programmer to work with [redacted] for 2 weeks starting 12 August 1970. 25X1

c. PHD operator to train for a week starting 20 August and also work on operational tests starting 27 August 1970.

4. Deliverable items were discussed and the following dates agreed upon.

a. Draft copies of operator training manual, operating instructions, and maintenance manual to be delivered by 1 June 1970.

b. Draft copy of acceptance test plan to be delivered by end of June 1970.

c. The revised Spare Parts List has been completed and will be mailed out shortly.

5. The contractor asked that ESD be reminded that the Maintenance Proposal does not include any special tooling. If auto collimators or other special items are required, ESD will have to provide them.

25X1 6. [redacted] Project Manager has been at [redacted] for the month of April running acceptance tests on the optical system. Everything is going along fine and final tests, the optical potentiometer parameter test, started on 22 April and will be completed by 4 March 1970. The highlights of the tests are reported below. 25X1

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25X1

a. In the resolution tests, using the NBS targets provided by [redacted] the resolution achieved is equal to or exceeds the values in the technical specifications. The achieved resolution in white light in all but a few cases, equals or exceeds the monochromatic requirement. In these few cases the green filter increased the resolution to the required value. At 200X on-axis resolution for both left and right sides was 1200 l.p./mm. With the F80 (1X mag.) objective the on-axis resolution is 540 l.p./mm for the left side and 600 l.p./mm for right side. At 80X and below the left and right side curves come together. There is only one section of the white light curves where the resolution is not very substantially above the requirement. This is for the F40 (1X mag.) objective between 50X and 60X and is for saggital "one third" and edge of field.

b. Illumination System. Minimum light level for the HPSC is 0.5 stilb at density 3.0. This occurs at 200X magnification and anamorphs 1:1.0 with white light. With green filter this drops to 0.23 stilb. With the anamorph ratio 1:2.0, the white light level drops to 0.25 stilb. In all cases the light level is higher than the contractual value of 0.2 stilb.

c. The magnification range is: 10X to 100X
25X to 200X
This deviates from the specifications of 20X to 200X. As reported in an earlier memo, vignetting occurs at 20X using the F40 objective. The rest of the zoom range is fine so [redacted] is proposing that this range be limited to 25X to 200X since there is adequate duplication on the 10X to 100X.

25X1

d. The anamorph range is 1:1.0 to 1:2.0.

e. The main illumination light attenuation is entirely even across the field of view.

f. As reported in an earlier memo, the reticle size change will have to be 1 to 2.5 instead of 1 to 4. The size of the reticle in the plane of the eyepiece will be 35 micrometers and 88 micrometers at the 2.5 setting. The apparent size of the reticle referenced to the film plane will be:

1.75 micrometers at 200X	7.0 micrometers at 50X
3.5 micrometers at 100X	10.0 micrometers at 35X
4.3 micrometers at 80X	35.0 micrometers at 10X

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The reticle spots, left and right, fuse properly at the eyepieces. The maximum reticle spot wander is ± 0.2 micrometers. This is within specifications.

g. The mechanics of the eyepiece system conforms to the specifications. The adjustments and switching systems perform very well and conveniently.

25X1 h. It will take [redacted] 8 to 10 working days to crate and package the optical system for shipment.

25X1 i. [redacted] are still on target for shipping the system by air freight on 19 May 1970.

7. From the telegrams and telephone conversations with the [redacted] 25X1 Project Manager, it appears that the optical system meets or exceeds all technical specifications except:

a. "The reticle size shall be adjustable from just above diffraction limit to 4 times diffraction limit." The range will be 1 to 2.5.

b. "Magnification continuously variable from 10X to 100X, or from 20X to 200X; depending on selection from two different objective lenses." Actual ranges will be 10X to 100X and 25X to 200X.

25X1 [redacted] has asked that these two specifications of the contract be modified. The technical monitor instructed them to submit their request in writing through the contracts officer.

[redacted] 25X1
Project Monitor

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25X1